Digital Learning Network

Virtual Professional Development: *Rockets to Racecars*

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NASA LE&RN, Learning Environments and Research Network, presents a series of professional development workshops tailored to the Virginia and National Standards. Educators, these free virtual professional development workshops are designed to enhance curriculum activities with NASA inspired lessons. Participants interested in receiving professional development activity units applicable towards license renewal must register and complete the 4 workshop series to accumulate 5 workshop hours.

Workshop sessions are presented by highly acclaimed, certified education specialists through video conferencing. NASA subject matter experts equip your teachers with the content needed to improve student learning. Courses run 75 minutes during each session, covering a range of topics aligned with the science, technology, engineering, and mathematics curriculum.

Registration through NASA LE&RN is required! Please use the following link to register
Professional Development Registration

2012 Workshops

3:15 pm – 4:30 pm ET	Session A
Wednesday, March 21, 2012	Rockets to Racecars Video Series: Fluttering Fun with NASACARS
Thursday, March 22, 2012	LineUp with Math: Smart Skies
Wednesday, March 28, 2012	Bernoulli's Law-Understanding Air Pressure
Thursday, March 29, 2012	Rocket Wind Tunnel

OR

3:15 pm – 4:30 pm ET	Session B
Monday, March 26, 2012	Rockets to Racecars Video Series: Fluttering Fun with NASACARS
Tuesday. March 27, 2012	LineUp with Math: Smart Skies
Wednesday, March 28, 2012	Bernoulli's Law-Understanding Air Pressure
Thursday, March 29, 2012	Rocket Wind Tunnel

*Upon completion of the workshop series, teachers receive all instructional materials needed to successfully implement and execute activities in their classrooms.

Spring 2012 Workshops

Engineering

Rockets to Racecars Video Series: Fluttering Fun with NASACARS

Description:

There are many variables that affect a car's ability to travel a straight path, let alone speed around a racetrack. Proper weight and balance are essential for the safe operation of a racecar, just as they are for an aircraft. The distribution of weight, and the location of the car's center of gravity affect the stability and handling of the car as it travels around the track. Test your ability to control these variables by adjusting the center of gravity.

LineUp with Math: SmartSkies ™

Description:

Just as racecars travel at high speeds in very close proximity to one another and navigate with the help of spotters, planes navigate crowded airways with guidance from Air Traffic Control. In this activity, students will test their ability to lineup airplanes traveling over US Air Space in Modesto, CA. Students will use a variety of math methods to analyze traditional distance-rate-time problems in air traffic control. Conflict between planes arises, and students must resolve real problems using math calculations.

Science

Bernoulli's Law-Understanding Air Pressure

Description:

When you're traveling at speeds of 200 miles an hour, it's important to understand that faster moving air creates lower pressure! Air traveling around a curved surface speeds up, creating an area of low pressure. Demonstrate this fact with simple experiments.

Technology

Rocket Wind Tunnel

Description:

Understanding how airflow around an object is affected by the object's shape is valuable information for both racecar drivers and rocket designers. Being able to measure this variable provides valuable data, and that's where wind tunnels come in handy. Both models and full-scale cars have been tested in the wind tunnels at NASA Langley Research Center, and are now tested in full-scale tunnels at team garages on a regular basis. See how you can build your own small-scale tunnel and do some testing of your own.

Standards

National Science Education Standards

Science as Inquiry

- Understanding of scientific concepts
- An appreciation of "how we know" what we know in science
- Understanding of the nature of science
- Skills necessary to become independent inquirers about the natural world
- The dispositions to use the skills, abilities, and attitudes associated with science

Physical Science Standards

- Motions and forces

Science and Technology Standards

- Abilities of technological design
- Understanding about science and technology

History and Nature of Science Standards

- Science as a human endeavor

Common Core State Standards for Mathematics (NCTM)

Operations and Algebraic Thinking

- Use the four operations with whole numbers to solve problems
- Generate and analyze patterns
- Analyze patterns and relationships
- Write and interpret numerical expressions
- Analyze patterns and relationships

Measurement

- Apply appropriate techniques, tools, and formulas to determine measurements

ISTE NETS and Performance Indicators for Students (ISTE)

Creativity and Innovation

- Create original works as a means of personal or group expression
- Use models and simulations to explore complex systems and issues

Communication and Collaboration

- Contribute to project teams to produce original works or solve problems

Research and Information Fluency

- Plan strategies to guide inquiry
- Process data and report results

Critical Thinking, Problem Solving, and Decision Making

- Identify and define authentic problems and significant questions for investigation
- Plan and manage activities to develop a solution or complete a project
- Collect and analyze data to identify solutions and/or make informed decisions

Technology Operations and Concepts

- Understand and use technology systems
- Select and use applications effectively and productively
- Troubleshoot systems and applications